THE COMBAT EDGE

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FEATURES

DEPARTMENTS

THE COMBAT EDGE

Air Combat Command Safety Magazine

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ACCent on Safety

Last night, as I was watching the daily recap of "the trial of the century," a haunting question came to mind — have we become desensitized to reality? In today's electronic society where we're constantly bombarded with graphic pictures of natural disasters, airplane crashes, multi-car pile ups, fires and explosions, have we become so separated from reality that we forget the consequences of our actions? Has seemingly endless exposure to the horrible consequences of someone's actions (or inaction) removed these events from the realm of reality? If so, we have become dangerously complacent and are being given a warning — we are more vulnerable when we refuse (or are unable) to recognize the results of our own actions.

Have you checked your complacency level and safety attitude lately? How often do you think about or plan for potential emergency situations at work and at home? Do you share the information provided in *The Combat Edge* with your family? Many of our articles are as applicable to your family as they are to you at work — use the information everywhere! When you have the green light at an intersection, do you check that the crossing traffic has really stopped for their red light? What about your seatbelt? What about that write-up in the aircraft forms? It only takes a few seconds to think about what we are doing, and only a slight bit longer to consider the simple precautions necessary to protect ourselves and others. If you cannot visualize the results of your actions, you probably shouldn't be doing what you're doing!

I strongly recommend everyone read Lt Gen Croker's great article on "Self Worth, Leadership and Safety." The message is pretty clear — Quality and Safety are intertwined in promoting world class performance as well as improved lifestyle. This should be no surprise to anyone. Both Quality and Safety should be cultures — they should permeate our everyday operations and attitudes. I challenge each and every one of you to make them an integral part of you own work ethic and lifestyle. Be the leader we are all looking for.

The May Safety Day window has been established as 8-25 May 95. Within that window, NAF, DRU, and wing commanders can determine the specific date for their safety day. The intent of the May Safety day is to stress the hazards of the upcoming "101 Critical Days of Summer" and to place special emphasis on ground and recreational safety as well as address the change to summer flying with longer daylight hours, heat, etc. Through your leadership, safety day will help the command attain our safety goals by keeping the operational mission and mishap prevention at the forefront of our activities. These actions, along with the continuous improvement of our quality processes and dedication to teamwork, will help us protect our people and preserve our resources. Work hard, play hard — BE SAFE!

Colonel Fack Acker
Chief of Safety

Self Wort

Lieutenant General Stephen B. Croker
Commander, 8th Air Force
Barksdale AFB LA

Today, our society consists of many mini-cultures. We have ethnic, racial, social, intellectual, economic, organizational cultures — to name just a few. In the Air Force, we have a leadership culture called **Quality**. We also have an organizational culture — one called **Safety**. While the quality culture is relatively new to the Air Force, the Safety culture has been nurtured and improved steadily since our very beginning (mostly because flying is dangerous business, and dying for no reason quickly lost its appeal). Safety is now firmly embedded in our way of doing business. Just look at our norms and self-sustaining values: we all want the Air Force to be the best and SAFEST service; we want our products to be SAFE; and we want our people to work and live in a SAFE environment. As individuals, we are taught to value safety (ours...and others); we don't pooh-pooh the Safety Program's worth; and we let safety influence and guide our behavior. Does that mean we don't make mistakes and we don't have accidents? Of course not! What it does mean is that as individuals and as a team, we work darn hard to improve safety in the Air Force.

It isn't "rocket science" when I remind you one of the most effective ways of achieving an accident-free environment is training... training... and more training so that safety becomes second nature — a habit, a reflex, something we do without thinking. For the most part, the Safety community has been extremely successful in providing good training and our leaders have been equally successful in making safety a daily habit. Unfortunately, we still read about airmen who stand up in and then fall out the back of pick-up trucks and about aircrews who perform aerial maneuvers they are told not to perform (which is dumber than dirt). Sometimes training just isn't enough. We are also seeing a rise in stress-related accidents and suicides which could be tied to force drawdowns, more TDYs by fewer folks and increased operational tempo. Are you concerned? I sure am.

Fortunately, our boss General Mike Loh has been working this hard for quite awhile. Some of his methods are obvious...and some aren't. Think about the slogan, "In ACC, no one is any more or less important than anyone else." How about the "We Care" Program? At first blush, those are Quality bywords. Did you realize they are also Safety bywords? Each of you IS IMPORTANT TO EACH OF US, and WE DO CARE and none of us commanders at any level wants you to have an accident. Try stressing your folks' contributions to the organization, both as a "worker bee" and as a human being with innate self-worth. (Look it up: "innate.") It will pay big Safety as well as Quality dividends.

I'm sure it is no surprise, but our new Chief of Staff is working on safety too. General Fogleman recognizes that we have an OPS

h, Leadership & Safety

TEMPO challenge. We have some folks on the road too much. (For example, the people who fly and support AWACS, AC-130s, and HC-130s were on the road from 160 to almost 200 days last year.) So, he's working to find ways to drive the maximum TDY days per year back toward 120 days because it adversely impacts training, safety and overall quality of life. He is finding smart ways to better distribute this TDY burden, like carving out a larger role for our WORLD-CLASS Guard and Reserve. They are eager to help and do great work. If you are hard-pressed, "try 'em, you'll like 'em."

Finally, there is a third tool in your tool kit: leadership. As the Chief told us recently, you don't "have to have *Commander* in your job title to be a LEADER." (Anybody with drive, thought and a little support from the bosses can be a leader with a little nurturing and encouragement.) "We have and need leaders at every level of the Air Force...[and] that leadership is the difference between a good unit and a poor unit." Steal the idea and help yourself and your unit by recognizing "leadership is the difference between a **safe** unit and an **unsafe** one." (I didn't say YOUR leadership....I said leadership.) Find the bright, eager natural leaders inside your units who exude safety and make safety their watchword and get them to help you work OUR problem. (You can't do it all by yourself any longer like you did as a junior officer or NCO; you're too busy and not nearly as smart as you used to be when you were 16 and knew everything.)

Leaders at all levels ensure their people are trained — trained so well that they instinctively do their job safely. Good leaders know their people and never short change safety. Good leaders also have the courage to make the hard decisions — like removing someone from flying status for safety violations, taking stripes for drinking and driving and removing from service those people who do not know the difference between taking dumb chances and taking necessary, well-calculated risks when the mission warrants. Good leaders also prepare their people to exploit mishaps when safety prevention fails. (How well you deal with "failed safety" is just as important as awareness and prevention in the first place...and often overlooked.)

Indeed, I would close this little piece by reminding you that today, recognizing everyone's mission contribution and self-worth, using all the tools in your tool box, developing leadership at every level and exploiting "failed safety" opportunities are the best ways of improving your safety culture. Like the Quality culture, the Safety culture is a mindset — an individual mindset as well as a corporate mindset. As we have incorporated safety into our everyday thinking and acting, we have moved that much closer to eliminating mindless and pointless loss of life. BUT WE ARE NOT HOME FREE. There is more to be done...and we have some good guideposts at hand. USE THEM TO YOUR BEST ADVANTAGE. ■

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COMBAT SEARCH AND RESCUE

With The HC-130 And Pararescue Teams

Capt Randy Turner, 71 RQS/DOW, Patrick AFB FL

SCENARIO: You're the mission commander of a large force tasked to fly 3,000 NM over water, hit a target and recover to a base an additional 2,000 NM from the target. All of this is at night and over water because your over-flight request was denied by a neighboring country. Two hours into the mission and 800 NM from land, one of your aircraft has an engine fire and the crew must eject. The nearest US Navy vessel is 300 NM down track and begins steaming towards the ejection area at its flank speed of 35 knots.

SCENARIO: You're lead of a four-ship sent to provide CAP for an exercise in northern Alaska. You are planning a live-fire as part of the exercise, so you and your wingman each have AIM-9Ls on the rails. Your trusty wingman accidentally lets one loose on you, and you're forced to eject 100 NM south of Prudhoe Bay. Upon landing, you find yourself laying in the snow with a fractured ankle and the temperature is real darn cold.

These scenarios have a couple of things in common: they take place over isolated, inaccessible terrain in a harsh climate; they're not totally unrealistic (may even sound familiar); and both could be adapted to a combat scenario by the addition of enemy ground, naval or air forces. So what does that have to do with the fighter pilot? Read on...

The solution to some of the immediate problems encountered in the scenarios by the former "crewmember-now-groundpounder" can often be the "munitions" I carry on the HC-130. To put it in your language, you've become my DMPI and I will deliver my "Mk 1 Pararescueman" and his weapons and equipment on target under a variety of conditions. If you happen to be in the water, I deliver a cluster of Mk1s and a RAMZ, which is an inflatable zodiac boat and motor. Pararescueman (PJ) "sub-munitions" are, like yours, tailored to the mission. While PJs aren't deployed to assist you in winning a fire-fight, they're pretty proficient in providing security for you and the objective area until a helicopter, ship, truck, tank, etc., arrives to get you home.

You can be on the ground and injured with what you carry in your survival pack and a PRC-112 radio, or with our PJs and their equipment. PJs are all trained as emergency medical technicians, and many are also paramedics. Their medical equipment and training kept a severely burned crewmember on a Norwegian research vessel alive for 2 days while the ship sailed into helicopter range for evacuation to a Coast Guard HC-130 and subsequent evacuation to a hospital. You can either have secure SATCOM, UHF/VHF, tactical FM or your PRC-112.

Without getting into the details about PJ operations, hopefully I've made my point. You

can be on the ground or in the water for several hours or longer by yourself, or you can be there with a team of people who are trained and equipped to operate in that environment.

The HC-130 isn't just a ride to work for the PJs. We carry a good bit of equipment which we can deploy if dropping a PJ team isn't necessary or their extraction hasn't been worked out yet. If you had the option of being afloat in your 1-man raft or being in a 6-man raft with food, blankets, fresh water, a raincoat, etc., which would you choose? If you end up on the ground in a desert environment with recovery a few hours away, do you want the water you carry or the 5-gallon jugs I can drop to you?

Dropping PJs or equipment isn't the answer in every circumstance. If the helicopter moving at 110 KIAS can be there in a reasonable amount of time as dictated by the tactical situation, the climate/environment and the survivor's physical condition, then there is no reason to put any more aircraft or people into the objective area. If locating a survivor is necessary, the on-scene commander will have to do that in a threat environment; but an HC-130 can do that much faster than a helicopter in a permissive environment. If a precautionary airborne alert is necessary, the airplane, with PJs, can orbit for a long time, depending on the mission. While the Airborne Mission Commander capability is touted as a primary role of the HC-130, that capability is extremely limited, and currently there are no training programs to correct that.

One of the more valuable lessons learned in the Southeast Asia conflict was outlined by E.H. Tilford, Jr., in his book Search and Rescue in Southeast Asia, 1961-1975. In his analysis he states: "The usefulness of search and rescue task forces in future conflicts will be determined by such factors as the geographic nature of the battlefield and, of course, enemy defenses.... Imagination and innovation within a system receptive to change brought improvement through the introduction of novel tactics and new equipment. Flexibility and readiness in the peacetime Aerospace Rescue and Recovery Service will be the key to future success in combat aircrew rescue. That flexibility will require a continuation of the same spirit of innovation and ingenuity that made combat rescue successful in the wars of Southeast Asia."

In order to make the maximum use of the available resources and accomplish the mission, you as mission commanders and planners have to know what's available to you and demand support. We in the rescue community have to be incorporated into your mission planning just like SEAD, CAP or any other integral part of your mission. To do that, just tell us where you're going and how you're getting there and we'll tell you what level of support we can provide. Let me be your rescue expertise and you worry about the other stuff. That's the only way we'll "win the race" to a survivor and get a better recovery rate than the 10 percent achieved during Operation Desert Storm. ■

A SUPERVISOR'S *Nightmare*

MSgt William A. Hodgson
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There's nothing like being a part of a well trained team — a team where every member knows what and how they contribute to mission accomplishment. A well organized and trained team, operating independently, is a source of supervisor's pride. But, something goes awry. One of the members starts to hinder the team's smooth operation. Often when this happens, supervisors fail to respond to the situation and sometimes unconsciously aid the disintegration of that team either by taking inadequate action or no action at all. For some unexplained reason supervisors at many levels find it hard to make the decision to let someone go. You know what I mean; fire them, replace them or give them their pink slip. Happens all the time in the civilian sector. It is part of the normal staffing cycle all businesses go through.

Supervisors must stand tall and make tough decisions by taking positive personnel actions instead of taking the easy way out by allowing "problem personnel" to PCS and hoping someone else will deal with them. In many cases avoidance of responsibility means a mishap just waiting to happen and lots of wasted dollars. Remember, that's your money too.

Recently, I was assigned to an Air Launch Cruise Missile maintenance element as NCOIC where I encountered a situation that occurs way too often in the nuclear weapons career field. Being new to the element, I took a few weeks to sit back and see how the element operated. From my initial evaluation, they had all the components to develop into a well organized, high quality maintenance team. When the element was starting to shape up, the unthinkable happened. One of the airmen became a loose cannon and had to be dealt with before he destroyed all the work and effort our front line supervisors had put into making the element better. That's when we ran into a system as strong as a brick wall. The system is filled with checks and balances, and without the proper paperwork the airman was returned to duty.

This young airman was assigned to the element directly out of technical school. He was new to the Air Force and the career field and, from all the early indications, ready and willing to learn nuclear maintenance. All the required security background checks were completed, and the individual was certified by the commander under the Personnel Reliability Program (PRP). He was cleared to start on-the-job training to be a Nuclear Weapons Specialist. At the time of his assignment, the element experienced a major increase in the normal scheduled workload to support the ALCM rebasing program, causing supervisors to perceive an impending shortage of qualified personnel to accomplish this tasking. The new airman entered upgrade training and was fully certified on all ten nuclear maintenance operations in less than 3 months. Unfortunately, he received nothing more than assembly line training. The required background on the nuts and bolts of why maintenance procedures were performed the way they were was neglected.

Sometimes I wonder how supervisors can let things like this happen? Fast track training is a short-term fix and, if not corrected, usually leads to long-term problems. Mainly, this

short-term approach is caused by pressure (or perceived pressure) from above to accomplish the mission within the timelines at all costs. This pressure (or perception) sometimes overrides our ability to use common sense and make sound management decisions. In this case this started the problem for this young airman. He worked on a maintenance team for over a year with continual minor discipline problems that went undocumented and uncorrected. If the infractions were documented, the paperwork was left in the supervisor's desk drawer. This was the first mistake. In fact, he was a clever young man knowing just how far he could push his supervisors. Just when he was about to cross the line, he would come back to be a model airman for a short time. He played head games with front line supervisors knowing they did not have what it takes to make that tough decision. When each successive supervisor had reached his limit, he moved on to the next team. This was the second mistake. Each team he was on experienced a let down in morale and decreased productivity and cohesiveness.

During this time period, he failed his end of course test twice but was eventually upgraded to the five skill level by the unit commander. He was allowed to continue to cause disruption by his actions and only complied with the requirements when confronted. His immediate supervisors failed to correct the situation and always seemed to go the extra mile to turn down the heat. After all, nobody in this small career field wants the reputation of "eating their own." We would rather be known as a maternal career field, one that nurtures and allows individuals to grow. I suppose this was the justification these same supervisors used to write the individual a top EPR. And, by the way, because nothing made its way to this young man's records he was considered for SRA below the zone.

I made a decision after hearing the airman make comments like, "something big is going to happen and you will be left to pick up the pieces." Another time he said, "this place is like a house of dominos and you can start the sequence and watch them fall."

It was time to solve this problem, and we spent the better part of a year trying to set the record straight. He was sent to the commander for a Personal Reliability Program review and what we thought was temporary decertification because of his latest statements and actions. Unfortunately, we were wrong and he showed back up at work. At this point, the stage was set for a serious accident. All the circumstances were in place for something bad to happen. I came down the hall leading to the maintenance bay and low and behold, one of my NCOs had, without thinking about the consequences, issued our problem airman an M-16 and 120 rounds of ammunition. He was tasked to perform outside security for the maintenance bay, which was under the Two Person Concept. I put a stop to that and finally convinced his immediate supervisor to take the appropriate action. What could have happened, we can only guess. Supervisors at all levels need to be concerned with the purpose of PRP. Personnel who act in an irrational manner must be removed from the work environment — not just prevented from performing nuclear weapons maintenance.

After getting a supervisor to provide the proper documentation, letters of counseling, EPR, and a few letters of reprimand, the commander had the justification to do the right thing. The young airman was finally permanently decertified under the Personal Reliability Program. As supervisors, we must make tough decisions and accept our responsibilities under PRP. ■

The Ge of Fligh

Maj Jeffrey C. Alfier
USCENTAF/A-5
Shaw AFB SC

A class in geography would typically involve a study of the surface features of the earth along with the spatial aspects of geographical phenomena, among other things. With an assignment to a world-wide deployable unit like AWACS, an air weapons controller is faced with the best geography lesson he could ever have. It becomes readily apparent at the start of training that global geography is the first homework assignment. It is like the old quiz game show where contestants had to gaze at a complicated maze of lines on a large screen and derive the answers they were seeking only after successive lines were removed, eliminating the visual obscurity to finally reveal a clear picture. This proves to be a good analogy of the controller, sorting through computer-generated displays and data inputs to see what is absolutely essential to successfully control his aircraft, to assist fighters as they search for targets on their way from point A to point B, or provide flight following en route to a bombing range. The computer is a great help, but very often humans can be overwhelmed with information which falls into the category of "nice to know," but not essential to mission accomplishment. It simply becomes clutter.

During their initial training and for some time thereafter, controllers spend a good deal of time cross-referencing the computer-displayed maps on their scopes with corresponding aeronautical charts in order to learn the geography and airspace structure of their particular area of concern, whether it be CENTAF, PACAF, USAFE, or some other area of responsibility (AOR). Names of cities, regions, airfields, and even small nations, obscure to most Americans, become common knowledge for AWACS crewmembers.

What becomes important, therefore, on the terrain of our radar scopes are the factors which form the landscape of "the geography of flight safety:" those lines and symbols that help us place aircraft under the controller's direction in the right relation to everything else in the sky.

For the air weapons controller (or air traffic controller for that matter), our situational awareness when controlling aircraft evolves from several things. The AWACS controller, in particular, who may be flying in any number of orbits world-wide, must be able to concentrate on a large slice of airmass. When we assume radar and radio contact with an aircraft, we are not only looking at the digitized "dot" on the scope that our computer identifies as that particular aircraft, but we must also see these radar contacts in relation to a dense airspace environment: civil air routes, airspace borders, the restricted airspace around airfields, restricted areas, special use airspace, and borders — both geographical and political. But what is particularly important about knowing the location of these areas? Practically speaking, we want to stay out of trouble with both civil and military air traffic authorities by making sure that we are controlling our aircraft in places they are supposed to be. Many of these places mark areas where the controller must focus on high density air traffic; and this, of course, is where flight safety is integral. This often becomes a multi-dimensional task as illustrated by CVFRs, which are constructed like upside-down wedding cakes, with the innermost areas having the lowest altitude limits and the outermost areas having the highest altitude limits.

When we take control of aircraft, we relate them

ography
t Safety

to two geometric planes, both the vertical and the horizontal; those spatial aspects in the geography of flight safety. Positive radar contact means that an aircraft is continuously controlled for vectors and positioning, etc., while the controller maintains responsibility for collision aviodance by directing the necessary changes of heading, altitude, and speed to gain or maintain safe separation.

In another example, when he sees an aircraft approaching a restricted area, the controller works to ensure that the pilot does not fly into that piece of sky. Very often we can display certain Notice to Airmen (NOTAMed) areas on our scopes, such as heavy glider activity or parachute jump zones. We know, of course, that aircrews check NOTAMs before taking off for the particular pieces of sky that they will be flying in; but if our controllers are also aware of these areas and their activation times, then all the better for we can point them out to the pilots or at the very least remind them about their existence.

Once the controller is sure of the location and deconfliction of his aircraft in relation to all the airspace and prohibited areas, the next immediate item on the controller's agenda is seeing his aircraft in relation to others. Sometimes this is the first priority, depending upon the density of air traffic. This is a deconfliction issue and an even more important one, than simply flying into someone else's airspace, for our primary task as controllers is to keep aircraft from flying into each other. Crossing the corner of a busy piece of civilian airspace without permission may be illegal but not necessarily dangerous, per se, if you do not hit another aircraft. If an aircraft's flight path did, in fact, "clip" a prohibited area and the controller saw another dot on his scope which told him that another aircraft was in possible altitude confliction, he would point that fact out first before telling the aircraft that it was, for instance, flying into a prohibited airspace. This is why we employ the axiom, "flight safety is paramount", at the beginning of our premission briefings!

Every controller has certain mandatory traffic warning calls that he is required by regulation to make. With adequate warning these calls will fall into two parts: the "call out" phase where the pilot is made aware of other traffic in his vicinity, and the "avoidance" phase where the pilot is directed away from a possible conflict through a heading or altitude change. All of this is done, of course, with respect to the airspace borders. The exact separation criteria is determined by command and local directives, often depending on such factors as altitude bands — low, medium, or high — or the type of aircraft involved; that is, avoidance of transports may have different criteria than avoiding other fighters. Generally speaking, in situations where fighters are operating at low altitudes in heavy traffic scenarios such as major exercises, the responsibility for separation rests with the pilot with only advisory type information being given from the controller. The higher the operating altitude the greater the degree of control, and responsibility for safe separation rests more

with the controller. When operating in airspace usually owned by the FAA, such as ATCAAs, the civil controllers call the military controlling agency, such as AWACS, to warn them ahead of time about civil traffic that needs to cross the airspace temporarily under their control. But what about safety considerations on the tactical side of the mission? In the reserved airspaces such as Europe's TRAs or the US's ATCAAs, fighter-to-target altitude separation is usually predetermined by the pilots by assigning altitude blocks; or, fighter and target set a standard 1,000 feet of vertical separation as assigned by either the controller or by pilot action. In the low altitude regime, however, separation becomes a more involved task due to the generally higher concentration of aircraft — both civilian and military. The controller must be aware of all these aircraft and their intentions. Most aircraft can be tracked through IFF. This is done through a feature which allows us to assign a permanent letter designation display next to the dot representing the aircraft as it flies from one place to another.

Identification of the targets through IFF is fine; but very often we will not see any IFF on a potential target, just the raw radar return (a dot which looks different than an IFF dot). The target, for instance, may or may not have its mode 2 on. The targets, to be valid for an intercept, may have to be flying above 300 knots and in VFR airspace. The AWACS computer that generates our radar display helps us determine these factors. And, as more targets enter the system, the more intense the situational awareness for the controller. This is due to several factors. The more aircraft that are displayed on the radar scope, the more computer data that must be quickly analyzed to see if it meets the commit criteria: the flight characteristics the target must have before the fighters can make an intercept. While this is occurring, once again, stranger traffic must be called out such as gliders, light civil aircraft, or military helicopters, while prohibited or restricted areas are to be made known and avoided. Meanwhile, the controller must still continuously provide tactical information to his fighters — the target's bearing and range, headings, formations, tactics, etc. The situation can get quite demanding in a short period of time!

That is basically it in a nutshell regarding separation criteria. In addition to the air traffic, there are other important things for the controller to be constantly aware of, such as changes in the local QNH or altimeter setting so that updated information can be passed quickly to all aircraft on his frequency.

Now there are several things that a controller can do prior to taking control of his fighters that can help him out in anticipation of such a busy situation. Of course, getting a solid working knowledge of the elements of the geography — airspace structure, primary and emergency airfields, and so forth — is the starting point. On the way to the AWACS orbit area the controller can check to see if certain restricted areas are active or not. There is no sense in wasting valuable radio time calling out a boundary that doesn't exist.

Additionally, as an internal factor for the controller, we can de-select areas on our scopes that we do not need to see such as inactive ATCAAs while we are controlling in VFR airspace down low. This process is what we refer to as "maintaining a clean scope" — seeing only what we have to in order to get the mission done and to keep it safe; everything else is simply the clutter of which I spoke earlier. Another thing that can be checked out ahead of time is which areas on the scope are the busiest air traffic-wise, particularly if the controller gets a scheduled mission that allows for some expectation of the level of controlling activity. This would facilitate the controller being able to tell his fighters, after they check in on his frequency, to anticipate a high level of air traffic. A typical advisory call along these lines would be , "Attention all aircraft on this frequency, heavy traffic over the Hamburg CTR, maintain VFR heads-up." There are alternate ways of pointing out such facts over the radio; but it is important that it is done, no matter what the format. This does not relieve the controller of making future safety calls, but it will increase the overall situational awareness for all players involved in the mission.

In conclusion, I have provided an insight into what goes through the air weapons controller's mind, the things he/she must look for and concentrate on as he/she gains and maintains the element of flight safety within the context of situational awareness. We can see that the geography of flight safety, as I have named it, is multi-dimensional concerning itself with separation vertically and horizontally not only from legally established boundaries, but also from other aircraft as well. The more aircraft that the weapons controller has on his/her frequency, the more complex his/her level of safety awareness. Task saturation can become a problem for the busy controller, but through a thorough knowledge of his/her airspace working area, the established training rules, and safety regulations, along with a lot of anticipation, he/she can successfully assist pilots in maintaining a safe flying environment while providing a high degree of tactical training. ■


Fleagle
HAVE YOU NOTICED HOW MUCH TH'AIR FORCE HAS CHANGED OVER TH' PAST FEW YEARS?
HOW SO, PEDO?
WITH SO MUCH UNREST IN SO MANY PARTS OF TH'WORLD, WE GOTTA BE READY TO MOVE IN A HURRY, WITH ALL GEAR IN WORKING ORDER.
TAKES SOME GETTING USE TO ALL RIGHT.
I'M EXPECTED TO BE IN TH'AIR AND EN ROUTE TO A FORWARD LOCATION TO ESTABLISH A WORKIN' BASE READY FOR TH'ONCOMING COMBAT FORCE.
WHERE DID FLEAGLE GO?
I DON'T KNOW.
GUESS WE BEST GO CHECK ON HIM.
© STAN HARDISON 1985
HARDISON
ARE YOU SURE THEY MEAN FER US TO TAKE ALL OUR GEAR?

PILOT SAFETY AWARD OF DISTINCTION

Capt Glenn A. McGinty, 101 FS, 102 FW, Otis ANGB MA

Capt McGinty departed Tyndall AFB in an F-15 for a redeployment mission to Otis ANGB. During cruise the utility hydraulic system failed and he initiated a divert to Warner-Robins AFB for an approach-end cable engagement. Capt McGinty emergency extended the landing gear, and flew a straight-in, visual approach to a perfect touchdown. On the first landing attempt, the tailhook skipped over the cable forcing a go-around. On his second attempt, Capt McGinty flew another flawless approach and landing. As he lowered the nose prior to cable engagement, the right main landing gear collapsed violently tossing him forward and to the right in the cockpit. Capt McGinty reacted immediately with simultaneous left-aft stick, left rudder, and full afterburners. His aircraft became airborne, just clearing the runway arresting cable. After another emergency landing gear extension Capt McGinty was joined by a chase aircraft who observed damage to the centerline fuel tank, right wing, and right horizontal stabilizer. The chase pilot could not positively confirm the status of the right main landing gear, although it appeared fully extended. Capt McGinty decided to attempt a third approach and flew another textbook landing successfully engaging the arresting cable.

AIRCREW SAFETY AWARD OF DISTINCTION

Capt John Kennedy, Capt Arlene Salmon, Capt Mark Harlow
MSgt John Elskamp, TSgt Randy Hedspeth, A1C James Cope
2 AS, 23 WG, Pope AFB NC

Approximately 50 miles off the coast of Florida, while leading a night seven ship C-130 heavy equipment formation to Haiti, the copilot noticed a flash of light from behind the radar scope on top of the instrument panel and then a green glow followed by a large flame with smoke rising up the center windscreen. The deputy lead aircraft was given charge of the serial and the mishap crew departed the formation. The crew attempted to eliminate the fire by isolating electrical systems. The radar was turned off. The flames and smoke stopped, and the pilot elected to land as soon as possible. However, flames and smoke began emitting from the same location. To further isolate the fire the air turbine motor and generator were turned on and the engine driven generators were turned off. Meanwhile, the self contained navigation system (SCNS) malfunctioned and it was also turned off. Without SCNS the TACANs and VORs were inoperable; however, visual meteorological conditions allowed for dead reckoning and map reading to the airfield. The crew had to revert to the manual control head for the UHF radio which would transmit and receive intermittently, leaving the crew virtually NORDO. The aircraft was aligned on final, configured for landing and received a green light from tower as clearance to land. While inspecting the damage after landing, it was discovered that a wire insulating spacer that connects electricity to the window heating element was missing, causing an arc-over which ignited the window insulation.

CREW CHIEF EXCELLENCE AWARD

SSgt Dean P. Plute, 78 FS, 20 FW, Shaw AFB SC

Staff Sergeant Plute, Dedicated Crew Chief, was performing his usual through-flight inspection of the F-16 that had just returned "Code One" During the BPO intake inspection of the GE-129 equipped Block 50D, Sergeant Plute noticed the leading edge of one of the engine's first stage fan blades had a very small nick in it. Sensing a possible serious problem, Sergeant Plute proceeded to borescope the engine and discovered one of the fan blade midspan shrouds had broken away. Concerned that a serious FOD incident had occurred, Sergeant Plute pressed further with his inspection and discovered the entire trailing edge of the first stage fan blades and all leading edges on the second stage fan blades were severely damaged. At this point, Sergeant Plute knew the engine was badly damaged and would need a more detailed examination by the engine ship. The engine was removed from the aircraft and dismantled for a detailed inspection. The entire engine (including the fan assembly, compressor section, combustor section, and all turbine blades) was severely damaged beyond repair. At some time during the previous flight, the midspan shroud broke off and completely FOD'd the entire engine. Without Sergeant Plute's detailed visual inspection, the small nick in the first stage fan may have gone unnoticed which would have resulted in a catastrophic mishap for the next pilot flying the aircraft.

FLIGHTLINE SAFETY AWARD OF DISTINCTION

SSgt Timothy J. Desmond, Amn Joel R. Barber
Amn James A. Chatterton, 56 RQS, 85 WG, Keflavik NAS Iceland

While troubleshooting an electrical problem associated with the cargo hook release system on an HH-60G, Sergeant Desmond and Airmen Barber and Chatterton determined there was a greater problem with the release system than previously suspected. These 3 individuals spent more than 40 man-hours over a 3-day period tracing wires through splice groups to destinations. They determined that whenever the pilot or copilot attempted to release the cargo hook, they were actually activating a group of wires that would operate the munitions installed on the external Stores Support System. The charged wires were properly wrapped and tied, but were still live electrical wires. The live wires could easily chaff and arc, causing a fire inside the aircraft. The technicians properly capped the wires and rewired the splice group in accordance with the technical orders. Operational checks confirmed the job was completed and the system worked properly. A check of the other three unit aircraft revealed one other had the same wiring deficiency. This was corrected and a message was sent to other units requesting they check for the same wiring problem. The skill, ingenuity, and persistence of Sergeant Desmond, and Airmen Barber and Chatterton in diagnosing a factory installed wiring problem prevented a potentially hazardous electrical deficiency and the possible loss of the aircraft and aircrew.

WEAPONS SAFETY AWARD OF DISTINCTION

MSgt Robert Lunde, SSgt Tony Hardy, SSgt Ron Lasitter
Amn Rodney Goins, Amn Jason Amon, Amn Glen Tole
2 MUNS, 2 BW, Barksdale AFB LA

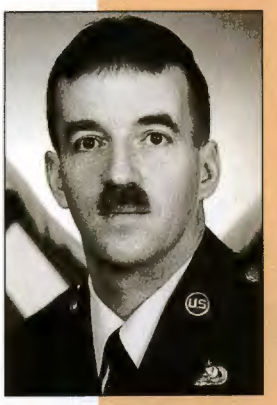
Imagine an electrical fire in an igloo filled to capacity with conventional explosives. The maintenance crew was finishing up a job changing burnt out light bulbs in storage igloo F-12, which was loaded to physical capacity, top to bottom, front to back with M117 750 pound general purpose bombs, when the light fixture that they were working on burst into flames. Airman Tole ran out of the igloo, and picked up one of the pre-positioned class A, B, C fire extinguishers that the crew brought with them for this job. Airmen Goins and Amon successfully extinguished the fire. They then exited the facility and reported that the fire was out. I then instructed everyone to get out of the igloo. The Fire Dept. showed up in record time. I informed them that it was an electrical fire, it had been put out, the power cut off, and the location of the faulty electrical fixture. If there is a moral to this story, it is this: "Never take short cuts in any operations involving munitions. You never know when an emergency might present itself." Changing light bulbs doesn't seem like a very hazardous operation, but even the simplest operations need to be accomplished with genuine respect when working on and around explosives. Sergeant Hardy's crew did the right thing during a highly stressful situation and quite possibly saved some of our most valuable resources-People. Remember, don't forget your safety briefings, safety is no accident.

UNIT SAFETY AWARD OF DISTINCTION

Metal Technology Section, 388 MS, 388 FW, Hill AFB UT

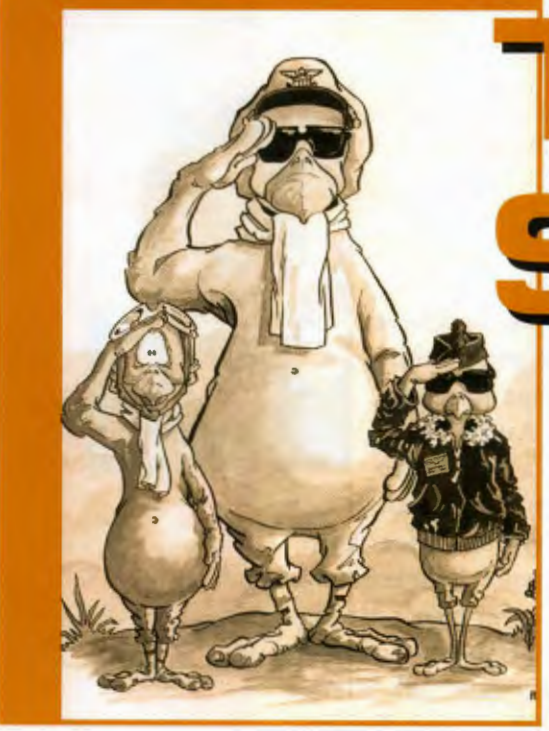
The Metals Technology Element set the standards for safety this quarter through the implementation of new safety equipment. The element recognized conditions in their shop that exposed personnel to potential hazards and aggressively took action to protect themselves. To counter electrical hazards, special welding boots were purchased to significantly reduce the chance of electrocution. New electronic welding masks dramatically improved the welders' vision; and flame-resistant clothing and gloves now prevent the chance of burns to the individuals engaged in hazardous welding situations. These equipment improvements resulted in the element effectively reducing the risks of severe personal injury by creating a safer work environment.

GROUND SAFETY INDIVIDUAL AWARD OF DISTINCTION



TSgt Thomas E. Scully, 20 OSS, 20 FW, Shaw AFB SC

As the Poinsett Electronic Warfare Range primary safety monitor, Sergeant Scully established a comprehensive safety program which has received numerous "Excellent" ratings. Safety inspectors identified his training plan and training handbook as commendable items and recommended his plan as a model for others. His safety program received the best rating of any 20 OSS element during the last 20 FW safety inspection. He demonstrated exceptional safety awareness during the pre-inspection of a new $125,000 maintenance building. He identified a contractor failure to install a neutral wire on 10 of the 100 and 200 amp, external 3-phase power connectors. Previously, the contractor had erroneously installed a ground wire in its place. If left unnoticed, the ground wire would have become the primary current carrier and would not have been used as an intended safety device. Additionally, had the circuit been "live" or shorted, the lack of a safety wire could have led to loss of life or severe damage of equipment. Sergeant Scully coordinated with the range manager, civilian contractors, and Air Force security police to establish a range stray animal reaction program. Domestic and wild animals are serious concerns of range personnel. Instrumental in organizing the unit hazardous communications (HAZCOM) program, he established a waste disposal plan for oil, oily rags, oil filters, lead acid batteries, and oil-soaked dirt, organized waste storage areas for batteries and florescent tubes, and eliminated several hazardous chemicals and lead-based paints. Impressed with the results, the squadron safety NCO took extracts from his HAZCOM training guide and operating instructions to use as examples for other squadron elements. The HAZCOM program received praise from the ECAMP inspector, commending it as an outstanding program.



TEAM SALUTES

The HQ ACC **TEAM SALUTE** recognizes a person, group of people or unit for notable displays of quality performance in the area of mishap prevention. **TEAM SALUTE** recipients are selected by the ACC Safety Awards Board from the monthly nominees for ACC safety awards. Periodically, **TEAM SALUTE** recipients will be featured in *The Combat Edge* magazine. Our congratulations to these recipients of the **TEAM SALUTE.**

SSgt Christopher L. Corn
347 OSS, 347 FW
Moody AFB GA

On 18 Aug 94, SSgt Corn, A Radar Approach Controller, intercepted a "Mayday, Mayday, Mayday" call on emergency frequency 121.5 from N2626R, a Cessna 182. He heard the pilot state that he was having engine problems and his approximate position. Recognizing the urgency of the situation, Sergeant Corn immediately keyed up the emergency frequency, radar identified the aircraft, and advised the pilot of the nearest airport. At this time, the pilot further stated that his engine was barely running and didn't know if he could make it to the civilian airport. Sergeant Corn gave the pilot a heading that took him directly to the airport and constantly gave him updates on the aircraft's position from the airport. Once the pilot reported the airport in sight, Sergeant Corn gave him traffic and wind information. Sergeant Corn's superb service significantly contributed to the aircraft's safe landing and is indicative of the daily service the 347th Fighter Wing provides to the local civilian flying community.

Capt Rem B. Edwards, III
8 FS, 49 FW
Holloman AFB NM

On 30 Aug 94, Capt Edwards was flying 70 NM east of El Paso, when his F-117A experienced several compressor stalls in the left engine. Capt Edwards determined that any setting above idle on the left engine would result in further compressor stalls. He declared an emergency with Albuquerque Center and turned for an en route letdown into Biggs Army Air Field. After dumping fuel and executing a flawless single-engine approach into Biggs, he landed and was advised by the tower personnel of a fireball following the aircraft at drag chute deployment. He turned off of the active runway via the high speed taxiway, shut down the engines, and exited the aircraft. After engine shut down, it became readily apparent that the aircraft had experienced a massive fuel leak in the left engine bay. Capt Edwards' quick and correct analysis of the engine problem minimized the amount of fuel being sprayed in the engine bay from a broken front guide vane actuator and a seized number four bearing in the engine.

2d Bomb Wing
Barksdale AFB LA

The men and women of the 2d Bomb Wing provided a superb team effort in rendering aid to a Navy Boeing 707 which was forced to land nose gear up at Barksdale AFB early in October 1994. Late on a Friday morning, Mudbug Control (2 BW Wing Operations Center) received a radio call from Waco 01, stating the aircraft was heading to Barksdale AFB with a hydraulic problem. What began as an inflight emergency from the loss of the

aircraft's utility hydraulic system quickly escalated to a much more serious emergency when the nose gear could not be lowered. Despite repeated attempts by the aircrew using alternate and backup systems, supported by technical assistance from personnel at Barksdale AFB, Boeing, and the Navy, the nose gear would not come down!

The men and women of the 2 BW gave vital assistance to Waco 01 and were instrumental in the aircrew's safe recovery, minimal damage to their aircraft, and superb support to the Navy Safety Board. It was the team effort of all 2 BW personnel, from the cook in the inflight kitchen preparing box lunches to the on-scene commander balancing the actions of several response teams, who made the nose gear up landing of Waco 01 a success story.

Capt Craig L. Anfinsen
Capt John N. Shanahan
334 FS, 4 WG
Seymour Johnson AFB NC

Capt Craig Anfinsen and Capt John Shanahan were flying an F-15E Strike Eagle on an Air-to-Air upgrade sortie in the W-122 overwater training area. During the second engagement, as Capt Anfinsen reversed his turn to the left the aircraft experienced an uncommanded increase in roll rate and G-forces, as if someone was pulsing the stick. Capt Anfinsen immediately recovered the aircraft, terminated the engagement and turned towards home station. While turning towards home, the aircraft again experienced an increase in roll rate and G-forces. They declared an emergency and began recovery procedures to Seymour Johnson AFB using delicate control inputs to avoid a re-occurrence of the flight control problem. During the landing phase, as the aircraft slowed, the nose slammed to the runway. Capt Shanahan observed that the left horizontal stabilizer was in a vertical position. This was the crews first indication of the seriousness of the problem. Their aircraft had experienced a very rare and extremely serious problem which has previously resulted in the loss of several F-15 aircraft. Post flight inspection revealed that the left horizontal stabilizer became disconnected from the hydraulic actuator in flight. Had the crew continued their engagement and entered into a slow speed fight, the aircraft would have departed from controlled flight and entered into an uncontrollable flight regime.

SSgt Ronald J. Schneider
SSgt Mark A. Murphy
SrA Mark D. Nino
A1C John S. Millhollan
Amn Corey D. Andrews
94 FS, 1 EMS, 1 FW
Langley AFB VA

It was the last mission of a two-week Weapons System Evaluation Program deployment to Tyndall AFB. Six F-15 Eagles (four of them configured with live missiles) were awaiting take-off clearance at the end of the runway. Unknown to the pilot of the number four aircraft, a small fire ignited at the base of the nose landing gear strut when he turned on the landing/taxi light in preparation for take-off. The EOR team quickly sprang into action. Sergeant Murphy notified Maintenance Control as he and Airman Nino visually directed the pilot of the Eagle to shut his engines down and execute a ground emergency egress. Sergeant Schneider positioned a fire extinguisher and prepared to fight the fire. Airmen Millhollan and Andrews quickly marshaled the remaining aircraft carrying live missiles out of the danger area and cleared the immediate vicinity of unnecessary personnel. The outstanding alertness, urgent response, and perfectly coordinated efforts of this professional team defused a potentially disastrous fire situation that involved multiple aircraft, live missiles, and numerous personnel.

TSgt Kevin Schwan
1 FW/SEF
Langley AFB VA

There is a belief in the multi-engine fighter world that is quite alarming — "It has two engines; if one fails, there's always the other one." What happens when the other one fails? What happens if you're the last person to perform maintenance on it? Similar questions can go on forever, but the bottom line is that aircrew lives depend on both engines operating — not just one. Operating with one bad engine significantly affects the chances of a safe and successful recovery and return to base.

With the quality culture that's sweeping the Air Force, there is no room for this attitude. Whether your job is flightline maintenance, backshop maintenance, or flying the aircraft, a quality job translates into mission success. A successful mission is difficult to accomplish on one engine in a multi-engine fighter. For example, an F-15 launches for a combat mission, the pilot executes the mission and during egress from the target area an engine fails. Oh by the way, he's being chased by a bandit. OOPS! There's a chute and a fireball. Was the mission a success? No, because there's a pilot in unfriendly territory with a multi-million dollar smoking hole. Why? With a failed engine, the aircraft will not perform nearly as well as with both operating normally. An F-15 is designed to operate with two engines providing 50,000 pounds of thrust and may not be able to out perform the enemy with only one engine operating. Not to mention the problem associated with max performance and asymmetrical thrust. Another example (non-combat): during return to base the #2 engine throttle cable breaks, the aircraft is low on fuel and the throttle is stuck in minimum augmentor. The pilot shuts down the #2 engine and #1 flames

TWO ENGINES:

One Fails, There's Still The Other...

out shortly afterwards. Guess what the aircrew checklist says: If neither engine can be restarted, eject. As a result, a jet was lost not from engine failure but from an external failure (throttle cable). One more quick example dealing with recent history of the F100-100 engine. Third stage fan blades can liberate anywhere around a 360 degree circle. If you think you have two good engines and one fails and the failure happens to be a liberated third stage fan blade, the potential is there for it to penetrate the firewall between the engines and cause the other engine to fail. Bet you know the rest of the story. The pilot had to eject because both engines failed. We can't rest on the belief "It has two engines; if one fails, there's always the other one." A proactive attitude and looking at the engines as one versus "It has two" will save valuable, limited resources and possibly the life of the pilot/crew. If we are proactive, the mission will be successful.

Yes, it's true; aircraft and engines are being built better and with more reliability; but there will always be the human factor in the equation. Even one lost aircraft and/or crew is not acceptable in today's shrinking Air Force. So, the next time you review forms for acceptance, perform an inspection, remove and replace a component or launch the aircraft, ask yourself, "Have I done all that I can do to ensure a successful mission?" If you answer no, can you live with the potential results? Can the Air Force maintain combat capability if other people have the same belief? If you can answer yes, then you've done your job. ■

NOT ME!

Mr. Ricke Moore
SWADS/SEG
March AFB CA

Many people suffer from a very common malady — the NOT ME syndrome. Apparently, this sickness also causes many to deny it! The NOT ME syndrome can be deadly; yet even in its simplicity, we fall victim to it on a daily basis.

When we enter our personal vehicles, the thought of anything other than a safe trip home is not even considered, NOT ME; so we get used to not having that seat belt fastened. What about when someone else executes the same California Stop you do at the same corner every day and you both enter the intersection and.... NOT ME!

One would think that with southern California rocking and rolling occasionally, life would be taken a little more seriously. NOT ME...it won't happen to me. "Why if the big one hits... I'm sure my property will escape unscathed..."

This disease seems to intensify in the work area. An attitude of being indestructible replaces our common sense. It seems that the average worker refuses to wear personal protective equipment because it's inconvenient, doesn't feel good, looks lousy, and anyway...it's NOT ME that it will happen to.

How many of you have gotten FOD in your eyes this year, or have dropped a heavy object on your foot, or maybe have broken out in a rash, etc., etc. The point is that we need to really evaluate the job process we are about to do before we do it!

It's been said that when "our time comes," there isn't anything we can do about it! But do you realize that 98 percent of what we do to ourselves is usually our own fault?

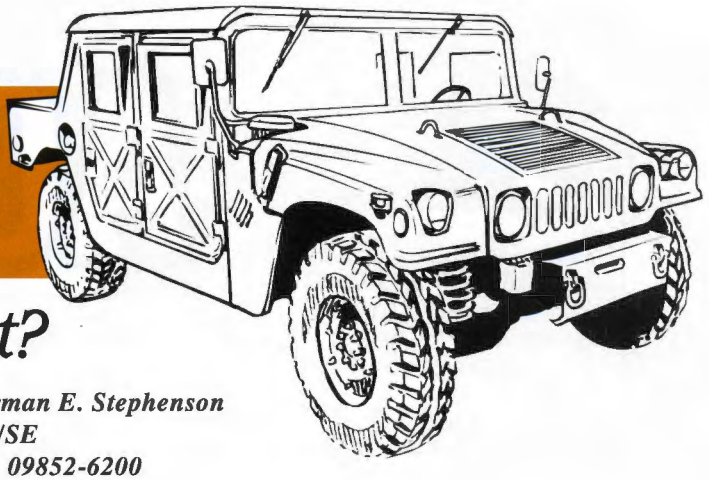
Help yourself out. When you drive, wear that seat belt and make complete stops at the intersections. Look around your work area before you begin a job and ask yourself, "what protective equipment do I need?" Look out for the other guy; he or she could accidentally seriously injure you. The flip side is that you watch your fellow workers and prevent them from causing bodily harm to themselves.

The NOT ME syndrome is curable with a little work. A critical element to the fix is called AWARENESS, and it only takes a second or two to put it in effect. I guarantee you that AWARENESS is your best insurance for a safer, care-fee lifestyle.

Remember, countless potential mishaps exist around you all the time. Keep the AWARENESS factor in operation and you can rest assured that a careless mishap will not happen to you...that's right NO — NOT YOU!! ■

VEHICLE MISHAPS CONTINUE...

Will You Be Next?



TSgt Norman E. Stephenson
4409 OG/SE
APO AE 09852-6200

For some of us assigned to Saudi Arabia, driving a vehicle on a full-time basis is a necessity. However, most people don't have the desire or the need to challenge the customs of Saudi driving — they wisely leave the driving to others. Many people also think attending the "Right Start" briefing to hear horror stories about driving in Saudi is a scare tactic to discourage personnel from driving. That's not our intent. These stories are not tall tales the safety office has invented. We can personally attest to the mishaps we investigated and want to warn everyone. By recounting these incidences we are saying "be aware." If we don't change our safety attitudes in the traffic arena, our luck will run out.

Driving in Saudi Arabia is challenging and dangerous, and our mishap rate is disturbing. With mishaps becoming more and more serious, we could soon have a loss of life mishap. It is time for all of us to reexamine our safety attitudes, on and off duty. Inattention seems to be the major mishap culprit. Personnel become complacent in their driving habits, leaving their guard down for a split second or so. You cannot afford to do that here; you have to be completely aware of the traffic environment around you at all times.

We all have different driving habits but can usually adapt well to new environments. But for some folks, Saudi Arabia is a different world, with a very different perception of traffic safety and of traffic laws. Here it seems you can ignore all the traffic laws without being penalized. **WRONG!!!** We have witnessed some military vehicle operators adopting many of the local driving habits (excessive speed, tailgating, and rolling through stop signs). Approximately 50 percent of US military members involved in mishaps have been found to be at fault — in violation of a traffic law or two. That's unacceptable!

We all have to make safety a priority. The safety office cannot do it alone. We need everyone's cooperation before it's too late. Instilling a positive safety attitude in all is not a hard sell; you just need a common sense approach. Supervisors should make it their business to get more involved in the safety of their personnel. We highly recommend supervisors conduct periodic safety briefings emphasizing driver safety. Additionally, they need to identify problem drivers (reckless drivers, traffic law violators) and revoke their driving privileges before someone is killed.

We have determined that many vehicle mishaps in the AOR have been the result of inattention, excessive speed, ignoring traffic signals, failure to yield the right-of-way, and failure to drive defensively. We now need to remind everyone, every day! Wake up out there, you might be next. The saying, "When in Rome, do as the Romans do" does not apply here. If you adopt the Saudi driving mentality, chances are your TDY or LIFE will be cut short. Think about it — is it worth your life?

■

Before you ask, "What's driving in Saudi have to do with me?" consider the fact that over 5,000 Air Force people are on duty there right now. For the forseeable future, at least, we will continue our presence in Southwest Asia. So, depending on your career field, you stand a good chance of getting to experience driving in Saudi Arabia — first hand.

- Ed.

ACColades

QUESTIONS OR COMMENTS CONCERNING DATA ON THIS PAGE SHOULD BE ADDRESSED TO HQ ACC/SEF, DSN: 574-7031

	TOTAL			ACC			ANG			AFR		
	JAN	THRU JAN		JAN	THRU JAN		JAN	THRU JAN		JAN	THRU JAN	
		FY95	FY94		FY95	FY94		FY95	FY94		FY95	FY94
CLASS A MISHAPS	0	1	6	0	1	3	0	0	3	0	0	0
AIRCREW FATALITIES	0	0	3	0	0	2	0	0	1	0	0	0
* IN THE ENVELOPE EJECTIONS	0	1/0	4/0	0	1/0	1/0	0	0	3/0	0	0	0
* OUT OF ENVELOPE EJECTIONS	0	0	0/1	0	0	0/1	0	0	0	0	0	0

* (SUCCESSFUL/UNSUCCESSFUL)

CLASS A MISHAP COMPARISON RATE

(CUMULATIVE RATE BASED ON ACCIDENTS PER 100,000 HOURS FLYING)

ACC	FY 94	0	1.1	1.5	1.8	2.4	2.4	2.0	1.7	1.7	1.8	1.8	1.9
	FY 95	2.3	1.2	0.8	0.6								
8 AF	FY 94	0	0	0	0	0	0	0	0	0	0	0	0
	FY 95	0	0	0	0								
9 AF	FY 94	0	0	0	2.1	3.3	4.0	3.2	2.8	2.2	2.1	1.9	1.6
	FY 95	0	0	0	0								
12 AF	FY 94	0	0	2.0	1.6	1.3	1.1	.9	.8	1.4	2.0	2.4	3.1
	FY 95	7.1	3.6	2.4	1.7								
DRU	FY 94	0	14.9	8.6	6.7	11.2	9.5	7.9	7.0	6.3	5.7	5.3	4.6
	FY 95	0	0	0	0								
ANG	FY 94	0	1.9	2.6	2.2	2.7	3.7	3.2	3.4	3.5	4.0	3.6	3.3
	FY 95	0	0	0	0								
AFR	FY 94	0	0	0	0	0	0	0	0	0	1.4	1.3	1.3
	FY 95	0	0	0	0								
TOTAL	FY 94	0	1.2	1.7	1.8	2.3	2.7	2.1	2.1	2.2	2.4	2.3	2.3
	FY 95	1.3	0.7	0.4	0.3								
MONTH		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP

* (HOURS NOT AVAILABLE)

ACColades

HONOR ROLL

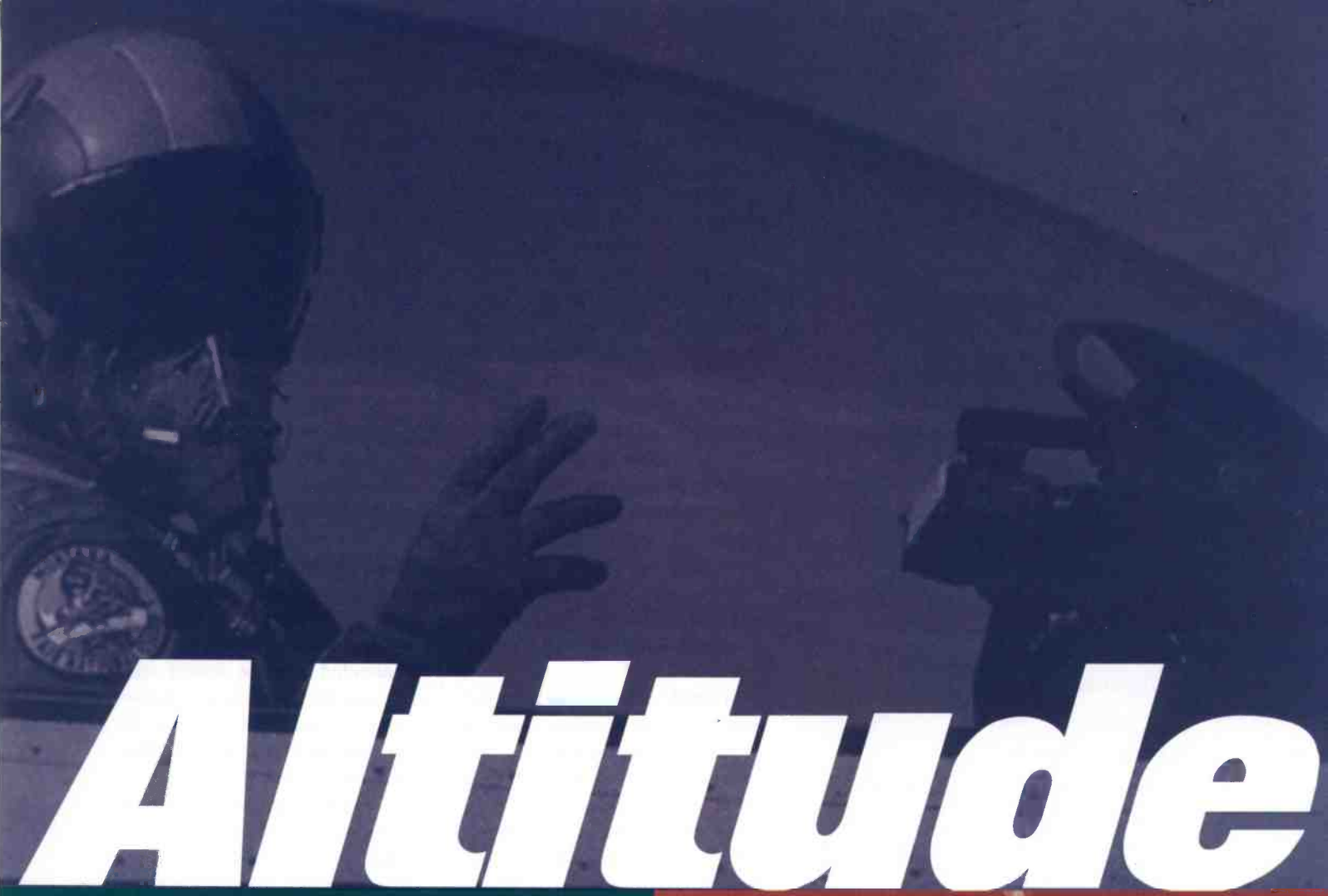
Units without a "Command-Controlled" Class A flight mishap since the stand-up of ACC on 1 Jun 92, or their respective assimilation into the command.

1 FW	113 FW	138 FG	175 FG	416 BW
4 WG	114 FG	139 AG	177 FG	419 FW
5 BW	116 FW	142 FG	178 FG	440 AW
24 WG	118 AW	143 AG	179 AG	442 FW
27 FW	119 FG	144 FW	180 FG	482 FW
28 BW	120 FG	145 AG	181 FG	509 BW
33 FW	122 FW	146 AW	184 BG	552 ACW
55 WG	123 AW	147 FG	185 FG	908 AG
79 TEG	124 FG	148 FG	187 FG	910 AG
85 WG	125 FG	150 FG	189 AG	911 AG
94 AW	129 RQG	152 RG	191 FG	913 AG
99 WG	130AG	153 AG	301 FW	914 AG
102 FW	131 FW	156 FG	302 AW	916 ARG
103 FG	132 FW	165 AG	314 AW	924 FW
104 FG	133 AW	166 AG	347 WG	926 FW
106 RQG	135 AG	167 AG	366 WG	928 AG
107 FG	136 AW	169 FG	388 FW	934 AG
109 AG	137 AW	174 FW	403 AW	939 RQW

Why The 2000 Foot Minimum Ejection

Maj Tom Breen
HQ ACC/DOTV
Langley AFB VA

After a recent study and subsequent lowering of the minimum uncontrolled ejection altitude, COMACC directed a similar look at the recommended 2,000 foot minimum controlled ejection altitude. The ensuing analysis addresses as many of the quantifiable factors associated with a controlled ejection as possible. It quickly became obvious that ejection seat capabilities, even for older ejection seats, far exceed the current 2,000 foot AGL recommended altitude. While ejection seat technology has improved vastly, the limiting factor continues to be the



Altitude

human element. The physiological and psychological stresses associated with ejection have not changed much since the first emergency ejection 45 years ago. Accordingly, this analysis focuses on human factors, system malfunctions, post-ejection procedures, and a statistical analysis, all which strongly support the 2000 foot AGL recommended altitude.

Human factor issues play a significant role in many phases of a controlled ejection scenario. Quantifying human factors has always been a challenge, but their effect is evident in most mishaps. The major pre- and post-ejection human factors are listed as:

Pre-ejection

Reaction Times: Components of total reaction time include recognition, latent reaction, decision time, and motor movement times. These vary due to inherent individual physiological differences, differences in personal training, experience and proficiency, and the degree of competition for attention from other detractors. Total reaction time from the start of the ejection decision until ejection initiation ranges from about 3 to 5 seconds as illustrated in Figure 1.

A more important consequence of this reaction time is that it would also become a factor if the seat failed and the aircrew was forced to initiate emergency manual parachute deployment while in free fall. This situation would certainly require a recognition time of greater than 1.50 seconds and is addressed in more depth later.

COMPONENT	TIME REQUIRED
Recognition Time	0.65-1.5 sec.
Latent Reaction Time (Vision Processing)	0.4 sec.
Decision Time	1.0-3.0 sec.
Motor Movement/Action	0.5 sec.
TOTAL	2.55-5.4 sec.

PRE-EJECTION REACTION TIMES

FIGURE 1

Distraction: If the aircrew is continuing to attempt an airstart or deal with other factors in the cockpit, distraction can significantly influence the pre-ejection processes. *Distraction is a leading cause of poor altitude awareness.*

Task Management: Competition between several possible desired task executions is likely in the pre-ejection environment. The effect of this competition on judgment, decision-making, and perceptual skills is difficult to quantify. It is safe to say that it will delay actions to some degree. Whether this delay is only 1 second or up to several seconds will depend on a variety of personal and external circumstances that can differ with every ejection.

Temporal Distortion: The human brain has no "clock" and very poor time estimation skills. Humans tend to underestimate the true passage of time, particularly in an emergency. In other words, more time elapses than we think. Temporal distortion is insidious, as it is anxiety reducing, and causes a loss of the sense of urgency. This time distortion, even in the controlled ejection environment, can cause delays in initiation of ejection. Studies indicate over two-thirds of all aircrew will experience temporal distortion at a time of acute stress and *that it may be the principle cause of delayed ejections and ejection associated fatalities.*

Altitude assessment: For ejections other than over near sea-level terrain, aircrews may need to rely on estimations of AGL altitude based on perception relative to the terrain and its features below the aircraft. At altitudes above 1,000 feet, this estimation is relatively inaccurate. In fact, aircrews do not normally experience "ground rush" until they are below 500 feet. This may cause delays in the ejection decision, as aircrew may underestimate their actual AGL altitude. Additionally, the utilization of digital (HUD altimeter, for example) versus analog (round dial altimeters) altitude information in the cockpit will result in varying degrees of "processing" time. Analog information transfer has been shown to be superior to digital interpretation times, but the quantity of time varies among individuals and is not large (probably less than 0.50 seconds difference). *Misjudging altitude and poor altitude awareness are not uncommon* in controlled ejection situations. Lowering the minimum ejection altitude would compound this problem by decreasing the margin for error.

Behavior (Judgment): Some aircrew may be influenced by ejection seat performance history and inappropriately delay ejection, thinking "the seat will save me." This influence normally comes at a bad time as the aircrew makes the conscious decision to delay ejection. Assuming the aircrew is aware of his/her altitude, it is this bending of judgment at that critical altitude which normally lures him/her into "pressing" it. The fact is the seat *will*, in most instances, perform at a much lower altitude (Dash-1 charts publish these minimums). However, regardless of which minimum recommended ejection altitude is used, the aircrew is tempted to press towards the seat's absolute minimum altitude capability. In doing this he/she fails to consider *that the absolute minimum altitude does not allow for any complications.* In this instance lowering the minimum recommended altitude would only *decrease the safety margin the aircrew has available between the recommended and the absolute minimum ejection altitude.*

Combined Effects: It is not uncommon for several of these humans factors to come into play at the same time when an aircrew is under stress. Prior to an ejection, aircrews often second guess themselves, worrying if they have done something wrong. Often, the aircrew will overcome preliminary human factors, make the cognizant decision that it is time to eject, then "give it one more try" since they are controlled and feel relatively safe at the moment. The trap is they can *again* be overcome by subsequent human factors (especially temporal distortion) and press to a dangerously low altitude. They fail to account for the post-ejection factors that will effect them once they pull the handles and submit themselves to conditions beyond their control.

Post-ejection

Training: Few aircrew are trained parachutists, and existing life support training does not approximate the true ejection environment. To most people the post-ejection environment is totally

foreign and open to a variety of possible reactions if everything doesn't go as published. One interesting note is the standard planned opening altitude for sport parachutists is 3,000 feet AGL. This is to give them time to deal with any problems even though they are usually highly trained in parachuting skills. *How individual aircrew approach the new and unfamiliar controlled ejection environment will vary greatly.*

Accomplishment of post-ejection checklist: Failure to properly or completely accomplish post-ejection checklists is not uncommon after ejection. Time is often the limiting factor. Figure 2 illustrates the time life support experts believe it will take to *properly* accomplish the required items.

NOTE: For night ejections, at least 2 additional seconds per checklist item are required.

Parachute Control/Steering: Parachute control and steering is a critical factor for avoiding hazards and setting up for proper PLF, thus avoiding injury. Factors include:

1. Perception and analysis of wind direction.
2. Perception and analysis of terrain and selection of desired landing area.
3. Decision time available to steer parachute.
4. Time and ability to accomplish the four line release.
5. Training: proper performance of steering maneuver.

CHECKLIST ITEM	TIME REQUIRED
Check Canopy	8 sec.
Visor Up	4 sec.
Remove Mask	12 sec.
Deploy Seat Kit	8 sec.
LPU Inflation	8 sec.
Four Line Jettison	15-20 sec.
TOTAL	**55-60 SEC.**

AVERAGE TIMES TO ACCOMPLISH POST-EJECTION CHECKLIST ITEMS

FIGURE 2

Additional discussion concerning parachute control and steering are covered later.

Ejection Actions Time/Altitude Comparison: An analysis combining ejection and post-ejection human factors supports the 2,000 foot AGL altitude. Figure 3 illustrates what physiologists and life support experts estimate as the time required for aircrew *"to properly accomplish what they have been trained to do."* When looked at from this standpoint, there is no value added in lowering the minimum ejection altitude.

Lowering the recommended controlled ejection altitude would serve to take away the altitude safety margin used to nullify the adverse effects of human factors on an ejection outcome. Human factors considerations favor maintaining the recommended 2000 foot AGL minimum altitude.

Not all aircraft utilize the same ejection seat. This analysis will examine the ACES II ejection system because of its commonality in many ACC combat aircraft.

The ACES II Ejection Seat

The greatest advantage of the ACES II ejection system is found in its low probability of seat and parachute malfunctions. The in-seat parachute, parachute deployment, and stabilization design make it highly reliable compared to earlier generation seats. Classic parachute malfunctions such as streamers, line overs, and inversions are rarely seen with this ejection system. However, the ACES II seat is not without its problems. The long parachute lines, coupled with a reefing system (which assures fewer seat entanglements and cleaner man-seat separations), cause a high instance of riser twisting. Twisted risers lock under the nape strap of the helmet making it impossible for the pilot to look up. Any such problem requires a finite amount of time to recognize and correct, nominally 30 seconds (500 feet of altitude loss). This delays completion of the post-ejection checklist significantly. The canopy cannot steer until corrected.

Major Failures/Remedies: There are two documented major system malfunctions attributed to the ACES II seat. More than 10 years ago an ACES II seat failed completely, resulting in a fatality when the manual backup actions could not be completed before ground impact. More recently, an F-15 initiator cartridge failed to fire. However, due to the fact that the F-15 had been modified to carry dual initiators, a tragedy was averted. As a result, all ACES II seats are being modified with both an improved emergency manual parachute deployment system and dual initiators. These modifications are due to be completed throughout the CAF by Aug 96. Although the risk of a seat failure is relatively low, it was deemed a high enough priority to dictate retrofit of all aircraft.

Backup System Use: The minimum time to recognize a failure, initiate the manual system, and get parachute deployment is approximately 10 seconds. This equates to *a minimum of 1,000 feet of altitude*

EJECTION ACTION	TIME REQUIRED	RESULTANT ALTITUDE
		2,000 ft AGL
Decision	3	
Action	2	
Ejection (Good Chute)		1,500 ft AGL
Checklist		
Wind Check	60	
Orientation		
		500 ft AGL
Parachute		
Steering	20	
Prepare For PLF	10	
Landing		Ground Level

EJECTION TIME/ALTITUDE COMPARISON

FIGURE 3

loss in freefall. To lower the ejection altitude would eradicate the remaining small pad.

Other Considerations: The F-16 does not allow the pilot to eject through the canopy. Should the canopy fail to depart the aircraft, the additional steps required to jettison the canopy and clear the aircraft *greatly elongate the ejection process.* Such a situation quickly reduces the "perceived pad" to the recommended ejection altitude.

While the specifications of the ACES II ejection seat are superb, there are documented instances of failures/malfunctions that markedly increase the time to "a good chute." The fact that such problems can occur even in a "state of the art" system supports maintaining the recommended 2000 foot AGL minimum altitude.

Post-ejection checklist completion

Time to Completion: The time required to complete the post-ejection checklist can vary greatly based on many factors. Some major factors include:

1. Currency and training for performing the multi-step checklist items will play into how quickly an aircrew can accomplish the task. Time to overcome the previously mentioned human factors will be required; thereby extending the time of checklist completion.
2. Aircrew are normally distracted immediately following ejection. They often will "watch" the aircraft fly into the ground and the ensuing fireball. This delays checklist completion.
3. Injury and the aircrew's physical condition can greatly increase time of accomplishment, even to the point of preventing checklist completion.
4. Parachute/system malfunctions take time to recognize, assess, and correct. Life support experts estimate that up to 1,000 feet (60 seconds) can be used trying to clear a line-over or partial inversion. Twisted risers can take 30 seconds. Four line release lanyards are, historically, difficult to find and release, thus more time and altitude are required. Failure to perform the four-line jettison results in large oscillations, severely limits the ability to steer the parachute, and greatly increases the risk of PLF injury.

To properly perform the post-ejection checklist requires a finite amount of time. Human factors, aircrew proficiency, injury, and possible parachute malfunctions increase the checklist completion times. Life support issues support maintaining the recommended 2,000 foot AGL minimum altitude.

The ability to orient and steer clear of hazards is critical to aircrew who find themselves in a post-ejection situation under a good parachute. As illustrated in Figure 3, a *best case* ejection at 2,000 feet will have an aircrew "in the chute" at 1,500 feet AGL, with checklist complete at an average of 500 feet AGL. This equates to 30 seconds to accomplish the following:

1. Locate hazards.
2. Make an input to steer the parachute and have it take effect.
3. Prepare for landing.

These figures make *no allowances* for parachute malfunctions. As mentioned previously, line-overs or partial inversions can take up to 1,000 feet (60 seconds) to clear. A hypothetical controlled ejection altitude of 1,000 feet AGL puts the aircrew in the chute at 500 feet AGL and halfway through his post-ejection checklist at PLF.
Lowering the ejection altitude from 2,000 feet to 1,000 feet would also severely limit the distance an aircrew could steer and track away from hazards. Below 1,000 feet AGL Life Science experts emphasize the greatest hazards are the fireball, ordnance, and burning wreckage. Depending on the amount of fuel on-board and the physics of the impact, it is possible to be fatally injured as close as 600 feet from the center of the fireball. If live ordnance is on board, the threat of a high-order detonation is real. Even after landing, an aircrew is still exposed to danger if he/she cannot steer far enough away from the wreckage. For example, USAF Fire Department safe distance figure for 20MM and 30MM HEI/HEI-T is 2,500 feet lateral separation.

Factors associated with steering a parachute to avoid hazards supports maintaining the recommended 2,000 foot AGL minimum altitude.

Data base: The data base used for this statistical analysis was supplied by the Air Force Safety Agency (AFSA). It includes 230 ACES II ejections from 8 Aug 78 to 31 Dec 92. Unfortunately, they cannot breakdown whether ejections were under controlled or uncontrolled conditions without reading through every report. Of the 230 ejections, 124 (53.9%) were initiated at or below 2,000 feet AGL.

Ejection Fatalities: Of the 230 ejections, 21 (9.1 %) resulted in fatalities. Of the 21 fatalities, 13 (61.9%) were from ejections initiated at or below 2,000 feet AGL. Nine of the 21 (42.8%) fatal ejections appear to be out of the envelope. Four of the 21 fatalities resulted from ejection system failure (two were caused by mid-air collisions). As illustrated in Figure 4, ejection fatality percentages rise significantly when ejecting below 2,500 feet AGL. Ejections at all altitudes above 2,500 feet AGL result in an average of a 9.7% chance of a fatality. The percentage of fatal ejections below 2,000 feet AGL rises dramatically to a high of over 22% at 250 feet AGL.

Ejection Injuries: The percentage of ejection injuries also increases dramatically when ejecting below 2,500 feet AGL (Figure 5). Of interest is the significant spike of almost 29% at 1,500 feet AGL. When the chances of injury and

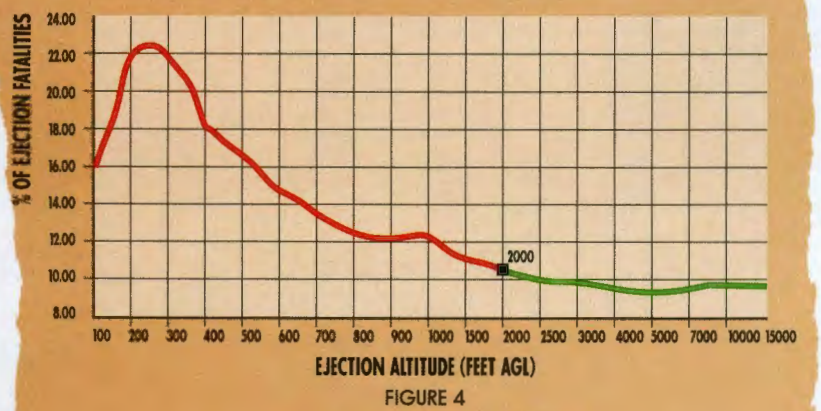


FIGURE 4

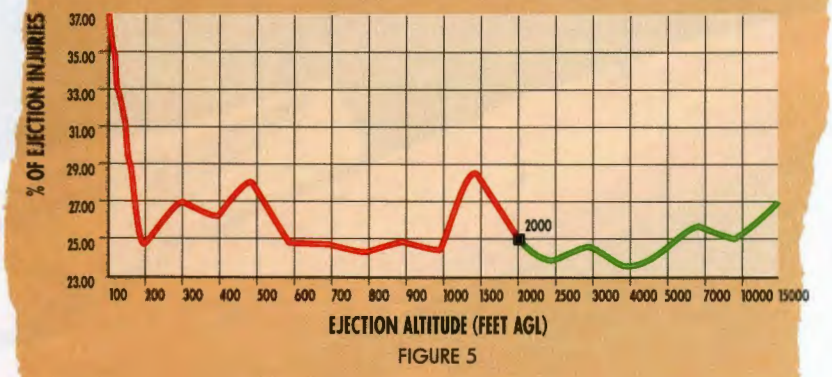


FIGURE 5

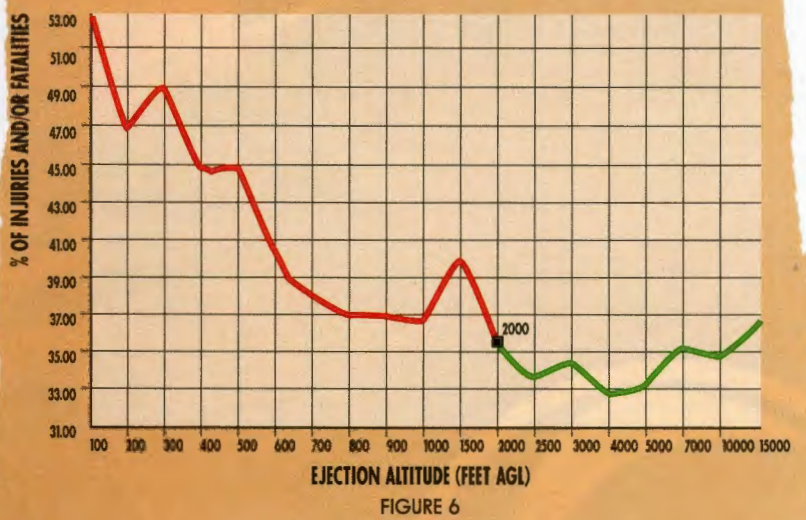


FIGURE 6

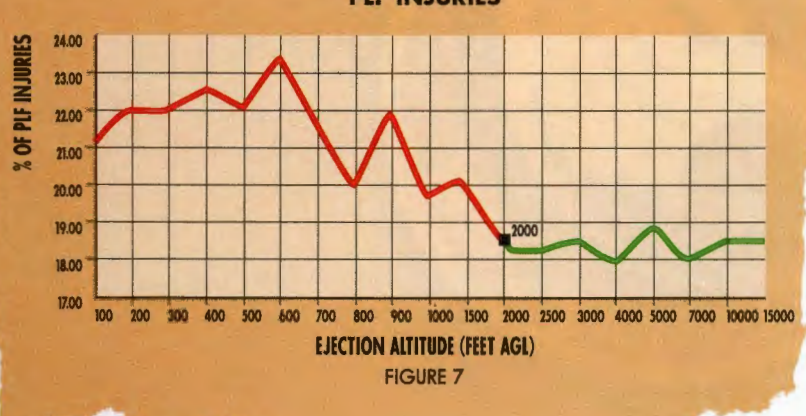


FIGURE 7

fatality are combined (Figure 6), a significant undesirable trend develops at 2,500 feet.

PLF Injuries: Of the 230 ejections, 40 (17.4%) resulted in injuries attributed to the PLF. Out of the 40 PLF injuries, four (10.0%) were major injuries, and all of these occurred from ejections at or below 1,500 feet AGL; 23 (57.5%) of the PLF injuries were from ejections initiated at or below 2,000 feet AGL. As is illustrated in Figure 7, a clear upward trend in the percentages of PLF injuries begins at 2,000 feet AGL. No correlation with injuries and type of terrain could be made.

While this data supports maintaining the 2,000 foot minimum ejection altitude, the number of variables and unknown circumstances associated with it should be considered. For example, when considering the PLF injury data, one must acknowledge that factors such as surface winds, recency of life support training, pilot stress level, light conditions, and even luck are not indicated. When considering ejection injuries and fatalities, little is indicated about the true circumstances of the ejection and factors leading up to it.

Despite the large number of unknown variables in the statistical data, each analysis shows a definite undesirable trend beginning at 2,000 feet AGL. Statistical data seems to support maintaining the recommended 2,000 foot AGL minimum altitude.

This analysis addressed as many of the quantifiable factors associated with a controlled bailout as possible. Ejection seat performance, as outlined in every Dash-1, would suggest a lowering of the recommended altitude. However, the combined weight of evidence relating to human factors, possible system malfunctions, post-ejection considerations, and statistical analysis convincingly argue that the current guidance is well thought out and should not be altered. Human performance is the limiting factor.

A second point that must be made is that the 2,000 foot altitude is, at present, a **recommended** minimum, not to be considered a regulatory "line in the sky." Each mishap presents a set of circumstances that are unique, with the added variables that each individual will react, to the same stimulus, in different ways and at different speeds. The entire mishap scenario must be analyzed before determining the validity of the aircrew's ejection decision. ■


EAGLE KEEPER
EAGLE DRIVER